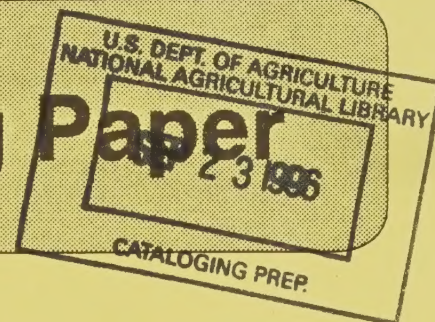


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NAPIA Briefing Paper



Pesticide Reduction: The Dutch Experiment

Concern for the impact of pesticides and fertilizers on human health and the environment has resulted in increased regulatory action in the United States and in other nations. On June 25, 1993, the U.S. Department of Agriculture, the Environmental Protection Agency, and the Food and Drug Administration announced plans for a multi-agency effort to find ways to reduce the use of chemicals in the production of the nation's food, assigning a higher priority to protecting the environment and "creating incentives for the development of safe pesticides" by taking such steps as removing pesticides that pose the greatest risks and implementing reduced pesticide use by increasing the reliance on integrated pest management (New York Times, June 26, 1994).

Introduction of the MYCPP

With steps being taken to enact further legislation in this country for the reduction of pesticide use, development of such a program in the Netherlands becomes more interesting to many groups in the United States. The following is a brief review of the Netherlands Multi-Year Crop Protection Plan (MYCPP) which began in 1991.

The MYCPP is part of the Agricultural Structure Memorandum aimed at safe, competitive, and sustainable agriculture production by the year 2000; preliminary evaluation of the progress of the MYCPP shows to date a "20 percent reduction of the use of pesticides compared to the reference period (1985), mainly due to decreased use of herbicides and fumigants" (Gullino and Kuijpers, 1994).

The goals of the MYCPP are to reduce current total pesticide use by at least 35 percent by 1995 and by 50 percent by the year 2000 (Ministry of Agriculture, 1990). Legislation, research, education, extension service, and incentives are mobilized in the Netherlands to enact this plan. The MYCPP will "produce drastic changes in crop protection in agriculture and horticulture for the period 1990-2000" (Gullino and Kuijpers, 1994).

How It Works

To reach the goals of the program, various agricultural sectors have differing pesticide reduction targets. There are 10 sectors ranging in size from 1.8 million acres for arable



The Netherlands

agriculture to a few acres for mushroom farming. Other sectors include bulb production, field vegetables, floriculture, pasture, arboriculture (tree nurseries), indoor vegetable production, fruit, and parks, countryside, and embankments (Ministry of Agriculture, 1990).

The largest, arable farming (cereal grains, maize, potatoes and sugar beets) must reduce pesticide use by 40 percent by 1995, and by 60 percent in 2000. To attain the target, soil disinfectants will be available only through prescription; herbicide use will be curtailed by encouraging band spraying, mechanical and hand weeding, and low-dose systems. Destruction of straw by chemical means will be discouraged and replaced by newly developed mechanical tools. Insecticide and fungicide use will be reduced by encouraging use of healthy starting material, biological and integrated control, and application improvement.

For field vegetable, chiefly cabbage, growers, the goals are 30 percent reductions by 1995, and 40 percent by 2000. Techniques being used include prescription use for soil disinfectants, integrated chemical and non-chemical weed control, selective herbicide use, and a requirement for equipment operators to pass competence tests and having responsibility for overhauling application equipment.

The lowest reduction is in pastures, which must reduce pesticide use by 20 percent by 1995, and 25 percent in 2000. Tools to achieve the reductions include integrated weed control, banning the application of herbicides in water courses and temporarily dry water courses, and restricting their use on embankments, monitoring damage by leatherjackets and March fly larvae in grassland areas, and requirements for operators like those cited in the previous paragraph.

Why Plans For Reduced Pesticide Use Were Developed

The development of the MYCPP, as well as its pesticide legislative and related activities, derives from several sources. First, public anxiety over the large-scale usage of pesticides, and the perceived fear that the quality of drinking water, and the environment in general are being jeopardized by pesticide use led to steps to limit usage (Ministry of Agriculture, 1990). Further, targeted pest populations are developing resistance to the current chemical treatments and the agricultural industry is searching for alternative chemical and non-chemical solutions for pest control in order to maintain high crop productivity.

Lastly, regarding the MYCPP, the Netherlands' pesticide policies are being directly influenced by their European neighbors in a movement that is sweeping not only Europe but this country as well--a movement calling for the reduction of pesticide usage in agriculture while maintaining competitiveness and productivity in the marketplace and simultaneously working toward a better protection of the environment through sustainable agriculture.

Pesticide Usage in the Netherlands

Approximately 600 different crops are grown in the Netherlands, with roughly 5,000-6,000 pests and diseases identified, including insects, nematodes, weeds, viruses, fungi, and bacteria. Dutch agriculture is heavily dependent on pesticides because of highly specialized farming systems, which result in limited crop rotations, and climatic conditions (Ministry of Agriculture, 1990). The Netherlands is one of the largest exporters of agricultural products in the world. The average use of active ingredient per acre of cultivated land in the Netherlands is 16.4 pounds; this considerable use is partially a result of the intensive nature of Dutch agriculture.

TABLE 1. Trends in Pesticide Use in the Netherlands.

	1984/88	91	92	93	95	2000
Fumigants	10.3	7.7	6.8	2.6	6.8	5.1
Herbicides	3.8	3.1	2.9	2.8	2.7	2.0
Fungicides	4.1	4.3	4.2	4.1	2.8	2.0
Insecticides	0.7	0.7	0.6	0.5	0.4	0.3
Others	1.5	1.8	1.8	2.2	0.9	0.7

Totals 20.4 17.6 16.3 12.2 13.6 10.1

*measured in thousands of kilograms per hectare

TABLE 2. Average pesticide use in several countries in 1987.

	kg. a.i./ha	pds. a.i./a
Canada	0.9	0.8
Denmark	2.6	2.3
France	4.5	4.0
Germany	4.2	3.7
Netherlands	18.5	16.4
Sweden	1.5	1.3
U.K.	5.8	5.2
United States	1.8	1.6

Source: Olsen, 1995

Strategies of the MYCPP

The purpose of the MYCPP revolves around three fundamental strategies: 1) working toward a reduction on the dependence on chemical pesticides; 2) reducing the actual use of chemical pesticides; and 3) reducing pesticide movements to air and water.

Regarding this first strategy, the MYCPP success of reducing agricultural dependence on chemical pesticides involves placing more importance on integrated farming systems and organic farming systems (Ministry of Agriculture, 1990). Integrated farming systems use fewer chemicals than intensive, traditional production systems. Organic farming emphasizes the avoidance of chemical pesticides altogether. Farmers will be encouraged to "make wider use of healthy starting material, to handle imported planting material more carefully, to rotate crops more frequently if possible, to grow resistant varieties, to apply (artificial) fertilizers more sparingly, and to take hygienic measures" (Ministry of Agriculture, 1990).

The second strategy of reducing actual pesticide use includes such measures as combining chemical and non-chemical weed control methods, using increased biological control, and improving application equipment for fungicide and insecticide use.

The third strategy of reducing environmental pollution from pesticides will occur with the subsequent reduction of pesticide use. Besides reduced pesticide use, additional measures will be required to achieve required emission reductions, especially glasshouse and champignon (mushroom) farms. Improvement of farm application equipment will be an important step in reducing pesticide pollution.

As table 1 reflects, Dutch agriculture had reached its 1995 goal by 1993. According to Dutch pesticide specialists, most of the reduction is attributed to utilization of newer low-rate pesticides and substantially reducing the use of soil fumigants. Bans on the use of atrazine and methyl bromide substantially reduced two high volume pesticides. To reach the goals of the MYCPP, total investment in research, education, extension and subsidies could be in excess of \$1.2 billion by the year 2000 (Olsen, 1994).

The education and extension element provides for 40 new staff positions and a special crop protection training program that will require every person applying, buying, advising or having pesticides applied to pass certain competence requirements. Additional requirements will be made of pesticide trade and distribution.

The research element will emphasize detection and monitoring of diseases, harmful effects of pesticides on the environment, application techniques, and biological control of pests.

Conclusion

In the United States, legislative activity regarding pesticides has increased in recent years as public opinion "changed from the general satisfaction with the status quo that was characteristic of the 1950s, so too did the impetus for legislative and political action" (Ragsdale and Sisler, 1994). It is because of the current intensive interest in pesticide regulation in this country that the developments of the MYCPP in the Netherlands are of particular interest.

Further, the Netherlands has developed a totally separate strategy for nitrogen and phosphorous use that complements the MYCPP.

It is most likely that the conflict over the health and environmental facets of technical advances will continue in Europe as well as in this country. The agrichemical industry faces a "period of retrenchment and increased economic pressure" in the upcoming years (Gullino and Kuijpers, 1994). The movement toward a more sustainable agriculture, with less reliance on pesticides, while maintaining high agricultural productivity and competitiveness will remain a challenge for the United States and Europe. Hopefully, through the enactment of scientifically-based legislation, which is carefully hammered out through the combined efforts of various participating government and nongovernmental organizations, including agricultural as well as environmental groups, the successful movement toward a safer environment and continued agricultural productivity will become a reality. Because the MYCPP is having some actual success in the Netherlands, it behooves the United States to look more closely at the mechanisms and specifics of this program.

This briefing paper was prepared by NAPIAP and derived from a variety of sources cited below. Thanks are given to Robin Bellinder, Larry Olsen, and Jim Seiber for their assistance and review of this briefing paper. For further specific information about the MYCPP, contact the Ministry of Agriculture, Nature Management and Fisheries, P.O. Box 20401, 2500 EK The Hague, The Netherlands. Additional copies of this briefing paper are available through NAPIAP, telephone (202) 720-4751, fax. (202) 720-1767.

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